IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

D. Remarks

Rejection of Claims 1-19 and 21 Under 35 U.S.C. §102(b) based on *Takeyama* (U.S. Patent No. 5,218,209).

The rejection of claims 1-9 will first be addressed.

The invention of amended claim 1 is directed to a method that includes bending a substrate by applying a force with a movable chuck portion to orient essentially all of a surface of the substrate at a predetermined angle with respect to an input source. In the method, applying the force with a movable chuck portion includes moving the movable chuck portion with respect to a stationary substrate receiving portion to bend the substrate.

As is well established, a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference.

The cited reference *Takeyama* does not show or suggest moving a movable chuck portion with respect to a stationary substrate receiving portion.

Takeyama discloses an ion implanter for implanting a batch of semiconductor wafers. This ion implanter includes a rotating wafer holding disk. However, in *Takeyama* the entire disk rotates, and thus does not include both a stationary substrate receiving portion and a movable chuck portion:

> [W]afer holding disk 1... has the wafer holding surface 1c... the wafer 2 is pushed onto the wafer holding surface 1c by a centrifugal force due to ***the rotation of the disk*** so that the top surface of the wafer is conically curved.[1]

To show the limitations of amended claim 1, the rejection relies on the following reasoning:

> Takeyama (col. 2, lines 44-67) discloses a movable chuck portion 1, a substrate 2, and a stationary substrate-receiving portion 1b.[2]

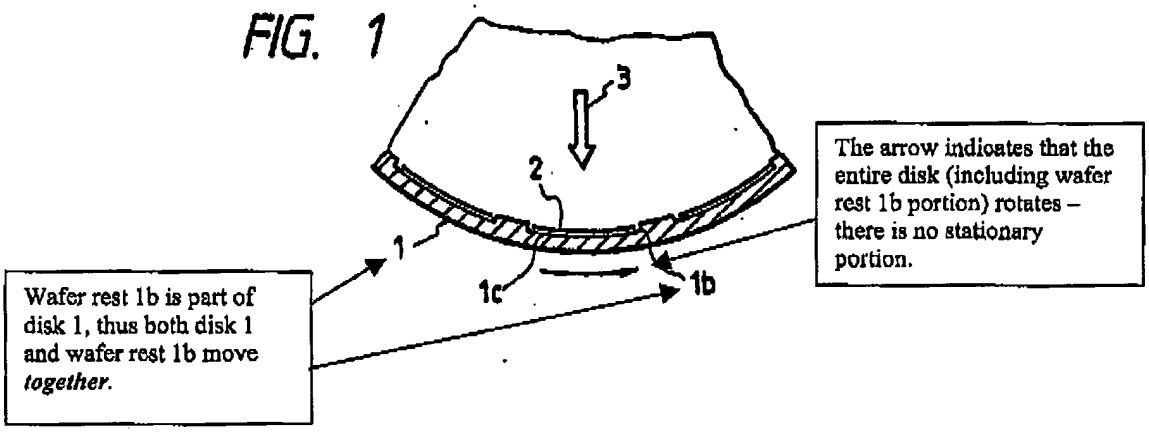
However, reference to both the text and figure of *Takeyama* shows that item 1 (argued to be a

[1] *Takeyama*, Col. 2, Lines 50-57, emphasis added.
[2] See the Office Action, dated 3/20/04, Page 3, Lines 1-2.

movable chuck portion) and item 1b (argued to be a stationary substrate receiving portion) are the portions of the same structure, a disk.

[W]afer rest 1b *of the* wafer holding disk 1...[3]

The figure of *Takeyama* clearly shows that the entire disk, including wafer rest 1b, rotates as one piece. Thus, the reference cannot show a movable chuck portion along with a stationary substrate receiving portion, as all portions of the disk move at the same time.



Accordingly, because *Takeyama* shows one rotating structure, the reference cannot show a movable chuck portion in combination with a stationary wafer receiving portion, and this ground for rejection is traversed.

Various claims depending from amended claim 1 are believed to be separately patentable over the cited art.

Claim 3 recites that the applied force comprises electrostatic force. Such a limitation is not shown or suggested by the cited reference. *Takeyama* discloses wafers that are forced into a curved shape, however the force is clearly centrifugal force, and not electrostatic force, as recited in claim 3.

[T]he wafer 2 is pushed onto the wafer holding surface 1c by a ***centrifugal force***

[3] *Takeyama*, Col. 2, Line 50, emphasis added.

due to the rotation of the disk so that the top surface of the wafer is conically curved.[4]

This present Office Action admits that *Takeyama* does not show electrostatic force:

> Takeyama (abstract) teaches that the force applied... is mechanical force, but ***lacks that the force applied... is electrostatic force.***[5]

Applicants add that the term "electrostatic" does not appear in the reference at all. Thus, because the reference does not the application of electrostatic force, the rejection of claim 3 is traversed for this additional reason.

Claim 4 recites that the force is applied by a movable chuck portion that is a split electrode chuck. Applicants would like to emphasize that *Takeyama* does not teach any type of electrostatic chuck, let alone a split electrode electrostatic chuck. As noted above and admitted by the rejection, *Takeyama* does not utilize electrostatic force, but rather centrifugal force.

Claims 7 and 9 recite that applying the substrate bending force includes attracting the substrate to the movable portion with an electrostatic force. As noted above with respect to claims 3 and 4, no electrostatic force is shown or suggested in *Takeyama.*

For all of these reasons, this ground for rejection is traversed.

The rejection of claims 10-15 will now be addressed.

First, the rejection of claims 10-15 is not sufficient to establish a prima face case of anticipation. The rejection of claims 10-15 relies on the following reasoning:

> Takeyama discloses a wafer 2, a chuck portion 1, and an input source 3, and a concave chuck portion (see figure 5).[6]

[4] *Takeyama*, Col. 2, Lines 54-57, emphasis added.
[5] Office Action, dated 3/20/04, Page 4, last two lines.
[6] The Office Action, dated 3/29/04, Page 3, Lines 5-6.

That is, the rejection simply argues that parts of the *Takeyama* ion implanter correspond to four claim elements. However, Applicants' claims 10-15 include many claim limitations beyond these limited elements. These limitations include, but are not limited to:

attracting a wafer with an electrostatic force,
applying a voltage to an electrostatic chuck,
contacting a stationary chuck portion and applying a force with a movable portion.

Because the rejection never indicates how/why these limitations are shown in the cited reference, a case for anticipation cannot have been established for this claim.

For this reason alone, the rejection of claims 10-15 is traversed.

In addition or alternatively, Applicants add the following arguments to further distinguish the invention of claims 10-15 from the cited reference.

The invention of amended claim 10 is directed to a method of processing an integrated circuit wafer. The method includes the steps of placing a wafer over a stationary concave chuck portion and applying a force by a movable portion to the wafer to conform to the concave chuck portion. The method also includes maintaining the wafer in the deformed shaped as the wafer is processed with respect to an input source.

To address this ground for rejection, Applicants incorporate by reference herein the same general comments set forth above for claim 1. In particular, *Takeyama* shows one rotating structure (wafer holding disk 1), and thus cannot show or suggest both a stationary concave chuck and a movable portion for applying a force to a wafer.

Various claims depending from claim 10 are believed to be separately patentable over the cited reference.

Claim 11 recites that the placing a wafer over a stationary chuck portion includes attracting the wafer with an electrostatic force. As noted in the above comments for claims 3 and 4, the reference teaches the use of centrifugal force, and never mentions electrostatic force, and thus cannot show such limitations.

Claim 12 recites that placing a wafer over a stationary chuck portion includes applying a voltage to an electrostatic chuck. *Takeyama* is silent as the application of voltage to any portion

of the disk 1. The reference is not believed to suggest such an arrangement, as the force applied in the reference is centrifugal force.

Claim 15 recites that placing the waver in concave portion includes contacting a stationary chuck portion on a first side of the wafer. The claim further recites that an applied force is an electrostatic force that attracts the first side of the wafer. Such an arrangement is not shown or suggested by the cited reference.

For all of these reasons, this ground for rejection is traversed.

The rejection of claims 16-19 and 21 will now be addressed.

The invention of amended claim 16 is directed to a system that includes an input source for processing the substrate according to a predetermined manufacturing step. The system also includes a chuck system having a substrate receiving surface that receives the substrate in an essentially non-deformed shape and a force applying portion. The force applying portion has a movable portion that moves with respect to the substrate receiving surface. The force applying portion also applies an attractive force between the substrate and the chuck system that maintains the substrate in a deformed shape.

The rejection of claim 16 relies on the following reasoning:

> Regarding claim 16, Takeyama (col. 2, lines 44-67) discloses a system comprising: and input source (col. 2, lines 44-67), a chuck system 1 having: a substrate receiving surface 1b... ***a force applying portion 3***...[7]

However, item 3 in *Takeyama* (argued to correspond to Applicants' force applying portion) cannot be a force applying portion, as it is an ion beam:

> For that reason, ***an ion beam 3*** is irradiated upon the surface of the wafer 2...[8]

Because an ion beam cannot be part of a chuck system, this ground for rejection is traversed. If the rejection is arguing that a force is being applied by the ion beam, this is

[7] Office Action, dated 3/29/04, Page 3, Lines 7-12.
[8] *Takeyama*, Col. 3, Lines 46-47.

incorrect. As noted above, *Takeyama* relies on centrifugal force to curve wafers. The ion beam it utilized to form particular structures in the wafer substrate (e.g., active areas, source/drains, below substrate isolation region).

In addition or alternatively, Applicants note that cited reference does not show various limitations of claim 16. In particular, *Takeyama* does not show a chuck system with a movable portion that moves with respect to the substrate receiving surface. As noted above, the entire disk of *Takeyama* rotates. Thus, there is no particular movement of one part of the disk with respect to another.

For all of these reasons, this ground for rejection is traversed.

Rejection of Claims 1-19 and 21 Under 35 U.S.C. §102(b) based on *Takeyama* and Inherency.

The rejection appears to rely on inherency to show all of the limitations of claims 1-15 and 21. The reasoning is set forth below:

> Regarding claims 1-15 and 21, the methods disclosed are deemed as inherent in the assembly of the apparatus... and are subsequently rejected.[9]

This rejection is improper and should be withdrawn or clarified.

The requirements for a rejection that relies on inherent teachings of a reference are well established.

> However, when an examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory. Compare *In re Rijckaert*, 9 F.3d 1531, 1533, 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the prior art) (citing *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (C.C.P.A. 1981)).

Thus, the blanket statement that Applicants' limitations are inherently shown in the reference is not sufficient for a prima facie case of anticipation. Applicants respectfully request a page and line citation to support the inherent presence of the following limitations:

1) moving a movable chuck portion with respect to a stationary substrate receiving portion (from claim 1);

2) applying an electrostatic force (from claim 3);

3) applying an electrostatic force with a split electrode chuck (claim 4);

4) attracting a substrate to the movable portion with an electrostatic force (claims 7 and 9);

5) placing a wafer over a stationary concave chuck portion and applying a force by a movable portion (claim 10);

6) attracting a wafer with an electrostatic force (claim 11);

7) applying a voltage to an electrostatic chuck (claim 12); and

8) contacting a stationary chuck portion on a first side of the wafer and applying an electrostatic force that attracts a first side of the wafer.

Applicants believe the above comments regarding the reference *Takeyama* make is clear that the reference does not show, explicitly or inherently, the bending or deformation of a substrate by utilizing a portion that moves with respect to a stationary portion, as the reference teaches only one large disk that rotates. Similarly, the reference does not show, explicitly or inherently, the bending or deformation of a substrate by utilizing electrostatic force, as the reference teaches only centrifugal force.

For all of these reasons, this ground for rejection is traversed.

Rejection of Claim 20 Under 35 U.S.C. §103(a) based on *Takeyama* in view of *Kubly et al.* (U.S. Patent No. 5,793,192).

As is well understood, to establish a prima facie case of obviousness, a rejection must meet three basic criteria. First, there must be some suggestion or motivation to modify a reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference(s) must teach or suggest all claim limitations.[10]

Claim 20 depends from claim 1, thus, to the extent that this ground for rejection relies on *Takeyama*, the comments set forth above for claim 1 are incorporated by reference herein. In

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[9] Office Action, dated 3/29/04, Page 4, Lines 1-3.
[10] MPEP §2143.

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particular, *Takeyama* does not show or suggest various claim limitations, thus a prima facie case of obviousness has not been established.

Claims 1, 4, 9, 10 and 16 have been amended. Claims 4 and 9 have been amended not in response to the cited art, but to revise claim dependencies and correct a typographical error.

Further all amendments to claims 1, 10 and 16 include limitations present in dependent claims, thus cannot necessitate any new grounds for rejection.

Claim 8 has been cancelled.

The present claims 1-21 are believed to be in allowable form. It is respectfully requested that the application be forwarded for allowance and issue.

Respectfully Submitted,

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